Municipal Groundwater Studies

Summary of Study Requirements

2001/2002

Ontario

Ministry of the Environment

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August 2001

Land Use Policy Branch
Ministry of the Environment

Cette publication technique
n'est disponible qu'en anglais.

Printed on 50% recycled paper
including 10% post-consumer fibre

PIBS 4117e

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1.0 INTRODUCTION

This document outlines the requirements for conducting a groundwater study under the current Ministry funding initiative (2001-2002), announced August 22nd, 2001.

1.1 Background

Groundwater is a reliable source of drinking water for almost three million residents of Ontario. More than 200 communities have groundwater-based systems to provide drinking water to residential users and to service the industrial, commercial and institutional sectors. In addition, approximately 90 per cent of the rural population relies on groundwater for drinking and other uses. It is clear that groundwater supplies for drinking water are essential and that the protection of this resource needs to be given priority. Groundwater is also essential to maintain the health of the ecosystem, of which we are a part. At the same time, significant information gaps remain on groundwater conditions across the province. Obtaining this information is necessary to develop future environmental policy and to support the development of effective groundwater protection strategies.

1.2 Municipal Groundwater Studies

The goal of the municipal groundwater studies initiative is to promote groundwater source protection across Ontario. The first phase of source protection is assembling a solid information base on groundwater conditions at a local and regional scale, and documenting potential risks to those resources. The information generated by these studies will provide a sound basis for developing and implementing effective source protection strategies.

Because groundwater systems do not conform to municipal boundaries, these studies require that municipalities, conservation authorities and other stakeholders work together. Regional and watershed-level cooperation provides the foundation for a place-based approach (i.e., aquifer/watershed) that addresses the goals of ecosystem and human health, and enables the private, public and non-government sectors to make informed policy decisions.

1.3 Ministry support

Participating municipalities are eligible to receive baseline funding to cover 70% of

approved groundwater study costs with an increase to a maximum of 85% for the inclusion of one or more of the following activities,

a) digitizing all data collected and submission to MOE,
b) georeferencing of all communal wells in the study area and submission to MOE,
c) developing a strategy for future capital avoidance, and
d) developing a terms of reference for a municipal action plan for implementing a groundwater source protection strategy.

2.0 Study Components

This section describes the individual study components that are required under this study initiative. The section that follows, provides general guidance on conducting groundwater studies, as well as process and funding administration details.

2.1 Wellhead Protection Areas

At a local scale, one of the most important areas from a geographic perspective is the surface and subsurface area surrounding a water well or well-field that supplies a public water system. It is through this area that contaminants are reasonably likely to move toward and reach the well supply. In particular, the production, storage, use, or release of biological and chemical contaminants can present a risk to groundwater in these areas.

Accordingly, an understanding of local groundwater conditions and potential sources of contamination is required. Specifically, all active municipal wells/well-fields in a study area should be investigated, and the following products generated for each one:

a) **Wellhead Protection Areas Delineation**, including:
   i) delineation of areas contributing water to each well (i.e. capture zones),
   ii) mapping aquifer vulnerability in proximity to the capture zones,
b) **Potential Contaminant Source Identification**, including:
   i) inventory the locations and relative threats to well water quality from existing and historical potential contaminant sources in the Wellhead Protection Areas; and
   ii) assessment of potential contaminant pathways in the identified Wellhead Protection Areas.

2.2 Regional Groundwater Assessment

Local groundwater conditions need to be understood within the context of larger regional groundwater flow systems of which they are a part. Basic groundwater functions of recharging, transmitting, assimilating potential contaminants, and storing and discharging water, play an essential role in maintaining ecosystem health. These regional groundwater functions are also necessary to provide a secure supply of clean water to communal water systems as well as individual groundwater users without access to a municipal supply.

Accordingly, an understanding of regional groundwater conditions and their susceptibility to contamination, is critical to maintaining these ecological and sustainable use functions. Specifically, the following components should be investigated for the study area, and the following products generated:

a) **Aquifer Mapping**, including:
   i) mapping Groundwater Recharge Areas and Discharge Areas;
   ii) mapping Inherent Aquifer Vulnerability across the study area.

b) **Regional Contaminant Source Inventory**, including:
   i) inventory the locations of potential point sources of contamination in the study area, based on available data bases;
   ii) mapping existing land uses in the study area, based on available data bases.

c) **Groundwater Use**, including:
   i) inventory of the location and permitting withdrawals from all wells in the study area (municipal, individual, commercial, institutional, industrial).

3.0 Other Study Requirements

3.1 Partnerships and conservation authority involvement

Because groundwater systems do not conform to municipal boundaries, municipalities, conservation authorities and other stakeholders need to work together on these groundwater studies. Cooperation among participants will enable the collection of compatible groundwater data that will extend to the natural boundaries of watersheds and groundwater aquifers.

Specifically, cooperation will be required among upper and lower-tier municipalities, public utilities, and conservation authorities in undertaking groundwater studies. Conservation authorities are capable of providing an essential watershed-level perspective to municipal groundwater studies, as well as a high degree of technical expertise. Accordingly, wherever feasible and with the agreement of all affected parties, it is expected that representatives from Conservation Authorities will play a major facilitating role in studies (e.g., project management). Upper tier municipalities are also expected to play a leadership role in these studies, depending on local circumstances.

3.2 Steering committee and public involvement

A steering committee is required for each study, and would be responsible for overseeing the technical and public involvement aspects of the study. It is strongly recommended that the steering committee include not only technical, municipal and consulting staff, but also representatives of the agricultural, business and industrial sectors, as well as any other community groups that may be affected by future municipal groundwater strategies. This approach is usually most successful in the development of a municipal action plan for groundwater protection which can be implemented by the community.

Involvement of the public in the study process is an important part of groundwater management. If the members of the public are involved and informed in the early stages of a study which assesses the location of the resource, the risks of contamination and current groundwater use, they are knowledgeable and educated when the municipality develops appropriate protection/prevention measures. Accordingly, each study must include a plan for informing and involving the public through a minimum of three public open house meetings, and other innovative and practical actions, such as setting up an education/information booth at local fall fairs. To further assist with groundwater education, MOE will provide copies of a groundwater education video, entitled "*Groundwater: Our hidden treasure*" to all participating municipalities.

3.3 Reporting and information requirements

All funded studies will be required to submit the following to the Ministry of the Environment:

i) A summary report and a full final report, including all maps and associated data.
ii) Three written copies of the summary and final reports, as well as one electronic

copy in WordPerfect or MSWORD and one electronic copy in PDF format.

iii) Copies of all tabular and mapping data (i.e., database files, GIS files) must also be submitted with the final reports.

3.4 Process and funding administration details

- Where there is a clear expression of interest, and capability to proceed with the study without delay, individual terms of reference will be finalized on a priority basis, using these study guidelines and component protocols, to suit local and regional circumstances (e.g., previous work complete, unique hydrogeology).

- Funding of approved studies will be administered by the following procedure and documentation requirements from participants:

    1) *Municipal Council Resolution* – The lead municipality(ies) for a given study area must submit a resolution of municipal council passing a bylaw authorizing the execution of an agreement between the Ministry of the Environment and the municipality for the province to fund municipal groundwater studies.

    2) *Competitive Process for Municipalities to Hire Consultants* – The lead municipality(ies) must submit documentation verifying that an objective, competitive process was followed in the selection of a consultant to provide technical services in the completion of a groundwater study. This would take the form of a letter from the municipality confirming the competitive process that was followed.

    3) *Final Terms of Reference* – Final terms of reference signed by the lead municipality(ies) and the Ministry of the Environment outlining expectations, accountability, potential cost-sharing, monitoring, and project description and timelines.

3.5 Eligible study costs

1. Costs paid to professional specialists (e.g. geo-scientists, hydrogeologists, engineers, economists, planners) and project management consultants for studies are eligible provided the municipality ensures these costs are properly supported by invoices and related solely to the study project.

2. In-house labour costs are not eligible. The cost of contract, part-time and student labour hired specifically for the project are eligible.

3. Miscellaneous costs related to the study as required by the consultant (such as rental of specialized equipment, drilling, pumping tests) are eligible. Municipalities, if in doubt should consult with the ministry.

4. The financing costs such as debenture costs and interest costs (interim financing charges) are not eligible.

4.0 MOE Contact Information

For more information, please contact:

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